

**Technology
for**

Alaskan Transportation

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IN THIS ISSUE ...

Road Dust

Chloride Corrosion & Bridges

Correspondence

NCHRP Report

Spoo is Oops Backwards

INSERTS ...

Salt

Computers and Your Health

Alaska Enhancement Program

DBE/ExEEO

New MUTCD

NCHRP-IDEA

Tax Cap Issue

New Publication/Video List

CALENDAR OF EVENTS ...

Who's Who in Transportation

**"Improving Alaska's quality
of transportation through
innovative technology and
information exchange."**



This newsletter is funded by a grant from
the Federal Highway Administration
and the Alaska Department of
Transportation and Public Facilities.

Road Dust in the Mendenhall Valley

**By Dean Nordenson, Public Works Department,
City and Borough of Juneau**

Several years ago, the U.S. Environmental Protection Agency set air quality standards for airborne particulates with diameters equal to or less than 10 microns, or "PM10" particulates. Both short and long-term standards were set as the particulates have been related to types of respiratory illnesses. As a result of this, testing programs were implemented and both Eagle River near Anchorage and the Mendenhall Valley near Juneau were found to exceed the short-term standards on several occasions throughout the year.

Various studies were done in both areas by several different agencies. In the Juneau area the primary source of particulates was found to be roadway dust from unpaved roads and fugitive

dust from paved roads as a result of excess winter sanding material. The unpaved roads were a year-round source while the sanding material was primarily present during dry winter and spring conditions.

Both communities developed strategies to reduce the particulate level to the acceptable limits. Short and long-term solutions with cost and the optimum use of local resources were reviewed. We will look at some of the solutions tried by the City and Borough of Juneau and how the current remediation program has evolved. First, the following is a list of some of the solutions that were tried and rejected:

(continued on page 2)

Evaluating Chloride Corrosion in Concrete Bridges

Chloride-induced corrosion is the number one cause of distress in highway structures. Because highway agencies around the world are faced with this perplexing and expensive problem, the Strategic Highway Research Program made corrosion of reinforcing steel in concrete bridges a major research priority.

The SHRP research was aimed at developing improved methods for evaluating the condition of bridges and providing associated, cost-effective preventive and corrective strategies. One of the first steps in evaluating the condition of concrete bridges is determining the degree in

which chloride ions play a part in the problem.

Chloride Content Determinations

Knowing the chloride content in the bridge is useful in assessing the structure's condition both before and after visually identifiable distress has occurred. Although it is difficult to determine when the first sign of visual distress will likely become evident, a history of the change in chloride content over time will allow an engineer to estimate when first distress will occur. This is important for realizing

(continued on page 3)

- * Watering unpaved roads was found to be ineffective, time consuming and of short duration.
- * Using Calcium Chloride to ease the dust problem was too expensive at \$350 per ton and appeared to wash out after each rainfall.
- * Using a specific chemical marketed for dust reduction was both time consuming and expensive and seemed to wash out completely within 2 weeks.
- * Road oiling using asphalt emulsion and a light sand for a blotter lasted up to 3 months, but was not deemed cost effective.
- * Substituting CMA (Calcium Magnesium Acetate) for winter sand proved to be too expensive at \$700 per ton.

With the failure of most of these short-term solutions, and the cost of paving (i.e. design, drainage, sub-base, base and asphalt) running between \$150 to \$200 per linear foot, it was time to explore other methods if long-term, cost effective solutions were to be found.

After extensive research, the Juneau City and Borough Public Works Engineering Department decided to try several types of BST (Bituminous Surface Treatments) and treated bases. While these types of projects have not been particularly successful throughout Alaska, it appeared that the prime causes of failure were poor weather conditions and lack of tight specifications.

Engineering and Public Works agreed on a trial project in the Lemon Creek Valley for the test. This location was chosen due to similar traffic patterns, geometry, street length, drainage, existing surface materials and dust. A very tight weather window was selected and rigid specifications were developed and enforced. All costs shown include design, inspection and contract costs. In June, 1991, the following four treatments

were selected:

- * 1,100 feet of "Canadian" surface treatment which uses an asphalt emulsion and a clean D-1 type aggregate. Cost is \$27 per linear foot.
- * 2,500 feet of double-coated BST using an "A" chip (3/4"), and "B" chip (5/8"). Cost is \$32 per linear foot.
- * 2,100 feet of double-coated BST on a 6" deep asphalt-treated base. Cost is \$60 per linear foot.
- * 2,100 feet of double-coated BST on a 6" deep Portland Cement-treated base. Cost is \$65 per linear foot.

During the 17-month period since the initial placement of the BST, Juneau has had record rainfall during each month, and a mild wet winter. While each one of the applications appear to be holding up in a satisfactory manner, additional cold weather data will be required before long-term conclusions can be reached. Because the Borough Assembly felt that the momentum of this project should continue, an additional 8,200 feet of asphalt-treated base with double-coated BST and 3,100 feet of 2" asphalt paving were completed in the Mendenhall Valley this past summer. Additional technical information can be obtained by contacting:

Mr. Bob Millard
CBJ Engineering Dept.
155 South Seward
Juneau, Ak. 99801

In addition to seeking alternate financial sources, The City and Borough of Juneau has committed to set aside a minimum of \$500,000 each year for the next 6 years. This funding comes out of Capital Improvement Project sales tax funds and is supplemented by Local Improvement District funds, a method where adjacent property owners vote to share in the project cost. This is an excellent example of community and governmental cooperation to achieve a successful project and meet stipulations of the Clean Air Act.

News & Views

Correspondence

Dear Director:

As a secretary for FWHA I have time to just skim over the Technology Transfer Newsletter. But when little "gems" appear such as the one titled "28 Secrets to Happiness" appearing in the Fall 1992 edition, I always find time to read and sometimes share with others that I know will appreciate this type of wisdom. So much of the information in these newsletters is of a technical nature—it's good to see and read the human side.

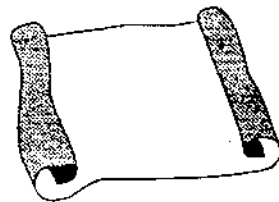
Jeanie LaBudie



**Drop us a line or
call at:**

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We love to hear from you!



Just In: NCHRP #348

The Alaska T2 Program library has recently received a copy of the National Cooperative Highway Research Program Report 348 entitled "Access Management Guidelines for Activity Centers."

The report offers information on effective access management practices, policies and enforcement techniques. This report appeals particularly to public and private traffic engineers and transportation planners who are concerned with the overall highway system within the vicinity of activity centers. The report also defines the overall concept of access management, reviews current practice and sets forth policy, planning and design guidelines.

If you would like to peruse NCHRP Report 348, please write or call Susan Earp at the Alaska T2 Program.

optimal performance over the design life of the structure.

Once visual distress is evident, chloride sampling provides a way to determine if the observed deterioration is indeed caused by chloride-related corrosion. If it is, a chloride survey may then be used to help select the best methods for further evaluation, as well as the corrective strategies.

SHRP researchers evaluated four methods for determining the level of chloride ions in the structure: (1) the specific ion probe; (2) spectrophotometer; (3) digital titrator; and (4) Quantab titrator strips. All of these methods require the acquisition of drilled powder samples. After extensive laboratory evaluation, the specific ion probe was selected as the best alternative, based primarily on technical performance and secondarily on cost, speed and ease of field operation.

Field Validation

To evaluate the techniques and procedures used in adapting the specific ion probe method for performing chloride determinations in the field, bridges were sampled in Pennsylvania, Florida, Wisconsin and Virginia. The sites represent a wide range of chloride exposure environments. The results indicate that the field procedure worked well, producing chloride content results that corre-

lated with the standard laboratory procedure (AASHTO T260).

Test Method Summary

The field method involves collecting the drilled powder concrete samples from various locations and depths in the concrete. Equipment needed includes a vacuum carbide drill bit and rotary impact hammer unit, a vacuum sample collection unit, digestion and stabilizing solutions, an electronic balance, and a specific ion probe and meter.

A 3.0-gram drilled powder concrete sample is digested in 20 milliliters of a digestion solution. This is stabilized by the addition of 80 milliliters of a stabilizing solution. A stable millivolt reading is taken of the stabilized solution using a specific chloride ion electrode probe. The millivolt results are mathematically converted into equivalent total percent chloride content or chloride content in pounds per cubic yard.

SHRP researchers have developed seven new techniques for assessing the physical condition of concrete bridges. The research findings are reported in a recently released eight-volume set. The set is available from the Transportation Research Board at (202) 334-3214.

Adapted from the Strategic Highway Research Program newsletter "Focus," October, 1992.

What Do You Think About Us

We need feedback from you for ideas on what types of articles you would like to see in this newsletter.

What articles did you enjoy the most, get the most information from, or use in your work?

What articles did you not like and why?

What subjects would you like to see covered in future issues of the newsletter?

Please use the space available or use an additional sheet to respond. Then send your answers to our office at:

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"Improving Alaska's quality of transportation through innovative technology and information exchange."

Spoo is Oops spelled backwards

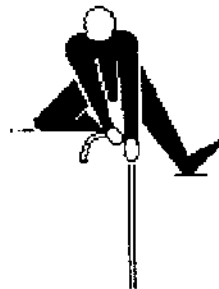
Note: The following letter was written to an insurance company following the author's on-the-job accident. The author remains anonymous.

I am a bricklayer by trade, and on the date of injuries I was working alone laying brick around the top of a four-story building when I realized that I had about 500 pounds of brick left over. Rather than carry the bricks down by hand, I decided to put them into a barrel and lower them by a pulley that was fastened to the top of the building. I secured the end of the rope at ground level and went up to the top of the building and loaded the bricks into the barrel and swung it out. I then went down and untied the rope, holding it securely to ensure the slow descent of the barrel.

As you will note on Block #6 of the insurance form, I weigh 145 pounds. Due to my shock at being jerked off the ground so swiftly, I lost my presence of mind and forgot to let go

of the rope. Between the second and third floors I met the barrel coming down. This accounts for the bruises and lacerations on my upper body.

Regaining my presence of mind, I held tightly to the rope and proceeded rapidly up the side of the building, not stopping until my right hand was jammed in the pulley. This accounts for the broken thumb.



Despite the pain, I retained my presence of mind and held tightly to the rope. However, when the barrel of

bricks hit the ground, the bottom fell out of the barrel. Devoid of the weight of the bricks, the barrel now weighed about 50 pounds. I again refer you to Block #6 and my weight.

As you would guess, I began a rapid descent. In the vicinity of the second floor I met the barrel coming up. This explains the injuries to my legs and lower body. Slowed only slightly, I continued downwards, landing on the pile of bricks. Fortunately, my back was only sprained, and the internal injuries were minimal.

I am sorry to report, however, that at this point I completely lost my presence of mind and let go of the rope, and, as you can imagine, the empty barrel crashed down on me.

Please know that I am finished trying to do the job alone. How about you?

Adapted from FHWA newsletter Road Business, Vol. 7, No. 2. 1992.

The Alaska Transportation Technology Transfer (T2) Program is funded by the Alaska Department of Transportation and Public Facilities and the Federal Highway Administration.

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"Work smarter, not harder."



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One of the most controversial issues ever to hit the Alaska DOT&PF is the use of salt as a deicer. Each winter, the state purchases about 13,000 tons of salt which either directly or through a sand mixture is used on Alaska's roads. And each winter, many people complain that the salt costs them a great deal of money from corrosion to their cars and ask the DOT&PF to find other ways of deicing roads.

But the DOT&PF has a federal and state responsibility to keep the roads around the state relatively free of ice for road safety and to prevent potential liability. Because of budget constraints, the department must use the most cost-effective deicer that is currently available.

Recent state and federal research done on the topic of road deicing point to the use of salt as the most efficient and least costly method of deicing. The use of two feasible alternatives to salt, Calcium Magnesium Acetate (CMA) and hot sand, have been studied with mixed results. But given the substantially increased costs of each alternative, and the strict limitations on the Alaska DOT&PF budget, salt continues to be the preferred deicing agent in Alaska.

SALT

Salt has been the most widely used deicing agent for years throughout the United States. Many northern states in the Lower 48 use extremely high levels of salt due to the problem of temperatures staying at or immediately below freezing for the entire winter. Because the weather in Alaska is generally

colder, often dropping to below zero temperatures, the state uses substantially less salt, and incurs less corrosion damage, than other states. According to the 1991 Transportation Research Board Special Report No. 235, Alaska uses an average of 1.2 tons of salt per lane mile a year. For comparison, of the 26 states researched, 18 average over 2 tons of salt per lane mile a year, and Massachusetts, Vermont, New Hampshire and New York each annually use an average of over 16 tons of salt per lane mile.

While the State of Alaska has used salt for over 20 years, the quantities and dosage rates have always been far below rates in other states. Consequently, corrosion of automobiles and bridge deck reinforcing is found in Alaska, but not to the degree that many states in the Lower 48 experience.

is justified. The inherent public costs if salt is not used, Milne said, come in the form of traffic accidents and possible harm to people during unsafe road conditions.

A recent study by Marquette University in Milwaukee, Wisconsin, found an 88.3 percent reduction in winter traffic accidents in the four hours after application of salt on ice and snow.

The study was performed by the Department of Civil and Environmental Engineering at Marquette University and released by Marquette Associate Professor David A. Kuemmel, P.E., Director of the Center for Highway and Traffic Engineering, during the Transportation Research Board's Third International Symposium on Snow Removal and Ice Control Technology.

Traffic Accident Rates Before and After Salt Spreading

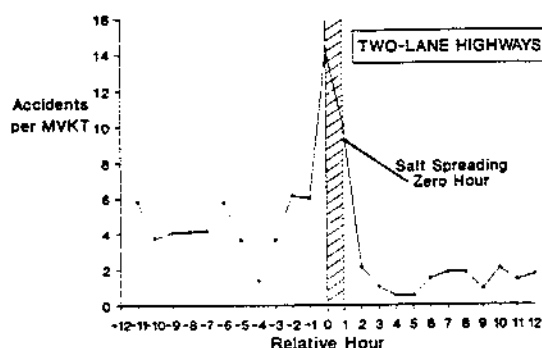


Figure 1

Many Alaskan citizens, however, feel very strongly about the use of salt, mainly because of the cost to their bank accounts. Clark Milne, Director of DOT&PF Maintenance and Operations in the Northern Region, agreed that there are costs to using salt, but because of the inherent public costs if the most efficient deicer is not used, road salting

The Marquette research found that the rate of traffic accidents involving injury is about nine times higher before salting than the rate of accidents after salting. The rate for property damage accidents is about seven times higher before salting.

Using these calculations, the Marquette study determined that

average direct costs of deicing are offset by direct benefits as soon as 71 vehicles have driven over the road on two-lane highways.

Professor Kuemmel explained that any vehicle accidents or traffic delays avoided after that first 25 minutes after salting can accurately

In addition to the immediate effects of salting on their cars, many people are also concerned about the effects road salt may have on the environment. The specific environmental concerns include the effects of salt runoff into ponds and waterways near the road and on roadside plants.

But large amounts of road salt can become a problem for animals and motorists, she said.

"Animals can be attracted to the salt on the roads, and can then become crash victims," Smith said.

The environmental specialist also said that road salt runoff can kill most wild plants alongside the highway. But most people are not concerned about typical "ditch" plants, and usually plants that are chosen to be along the road are those that are tolerant to salt, she said.

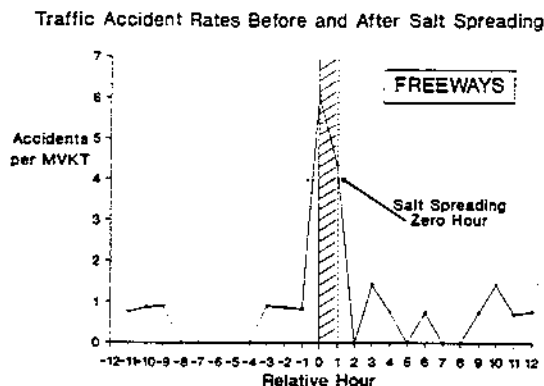


Figure 2

be characterized as a "profit" on taxpayers' investment in deicing.

"Moreover, our study did not address indirect benefits of deicing, such as the life-saving potential of quicker response time by police, fire, paramedic and ambulance personnel. Nor could it include reduced loss in worker productivity because workers arrive late or reductions in business loss due to undelivered good or lost retail sales because of travel difficulties. Common sense tells us that such savings multiply taxpayers' original return on our investment in deicing," Kuemmel said in a news release.

The Marquette analysis was made during the 1990-91 winter in four states: New York, Illinois, Minnesota and Wisconsin. It covered a network of randomly selected two-lane undivided and multi-lane divided freeways of approximately 520 and 50 miles respectively. The sections tested were primarily rural or suburban in character. See Figures 1 and 2.

The Alaska Department of Environmental Conservation regulations do not require that DOT&PF obtain any permits to use salt on roads. The DEC water quality standards set maximum allowable pollutant thresholds for "dissolved inorganic substances," the category chloride salts fall under. Salt levels are not exceed 1,500 milligrams per liter (mg/l) for waters where growth and propagation of fish, shellfish and other aquatic life and wildlife occur, nor 500 mg/l for drinking water sources.

Currently, the DEC is unaware of any documented evidence that runoff from road salt has exceeded the levels of water quality set in the state regulations. Amy Smith, an environmental specialist with the Alaska DEC, said the current levels of road salting are low enough not to cause any water contamination. Usually the salt precipitates out of the water, or becomes so diluted that its presence does not matter, she said.

CALCIUM MAGNESIUM ACETATE (CMA)

Laboratory reports show that CMA causes fewer corrosion problems to cars and is less detrimental to common highway materials than salt. Recent findings also indicate that CMA is less corrosive than salt to new reinforced concrete and does not accelerate corrosion of older, chloride-contaminated concrete.

However, the biggest drawback to the use of CMA is the cost. Salt costs an estimated \$100 per ton in Alaska, including the purchase and shipping of the mined chemical. Liquid CMA, on the other hand, is expected to cost around \$1,000 per ton. It also takes about 1.7 to 2.0 times as much CMA to equal the melting power of salt, which brings the cost comparison to \$1,700 to \$2,000 per ton of CMA to \$100 per ton of salt.

The main reason CMA is so expensive is that few companies manufacture it. A pilot study done by researchers in the University of Alaska Fairbanks Petroleum En-

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gineering Department from 1982 to 1984 showed that CMA could be produced locally from acetic acid, hydrated lime and native limestone. R.D. Ostermann and M.J. Economides of the Petroleum Engineering Department produced over 12,000 gallons of saturated CMA solution which was used in road tests in Fairbanks and in environmental studies.

For a grass-roots operation located in Fairbanks, the study estimated the total initial capital cost at \$215,000, including site and structure costs. Using 1985 prices for acetic acid, limestone and hydrated lime, a product price of \$413 per ton (dry CMA equivalent) was required for a 15 percent annual rate of return. The costs of the raw materials amounted to over 85 percent of the annual operating costs with capital costs through installment payments that amounted to only 2 percent of the product cost. Moreover, acetic acid cost alone accounted for 70 percent of the product price. The key to reduced prices of local CMA lies in obtaining inexpensive acetic acid.

CMA tests by DOT&PF on roads across Alaska have yielded similar results. In addition to the dramatically increased cost of purchase and the need for more CMA to match the deicing effect of salt, CMA was found to be less effective at lower temperatures (below 23 degrees Fahrenheit) than salt. And the time it took for CMA to begin melting ice and snow was a half an hour or longer than it would have been for salt.

Billy Connor, an Engineer with DOT&PF Construction, said that CMA also has a bad tendency to "bloom," or form a white powder when it dries out. He said CMA easily cakes up and clogs spreading

equipment and tends to blow off the roadway after spreading.

Other northern states, as well as some Canadian provinces, reported to the Transportation Research Board similar results with CMA. In Massachusetts, CMA did not perform as well as salt when the temperature dropped below 23 degrees Fahrenheit and during heavy snowfall and freezing rain. Researchers in Ottawa reported that CMA was slower acting and less effective in colder temperatures and low traffic volumes, and roughly 60 percent more CMA was used than salt.

However, research findings in the area of health and environment were more positive. Studies by the TRB indicate that CMA is likely to have no adverse effects on human health and few negative environmental effects. Because it is biodegradable and exhibits poor mobility in soils, it is less likely than salt to reach groundwater. CMA has exhibited negligible adverse effects on common roadside vegetation and is apparently safe for use near most water environments, although the effect of heavy CMA treatments near some small, poorly flushed or poorly diluted ponds and streams may require monitoring.

A study was done by UAF researchers to see what the effects of CMA would be on water areas near roads. The report, entitled "Effects of Calcium Magnesium Acetate Deicer on Small Ponds in Interior Alaska," was completed in 1986 by Caryn L. Rea, a graduate research assistant and Jacqueline D. La-Perriere, an associate professor of water resources and fisheries with the Water Research Center at UAF.

The study showed that CMA added to small ponds increased

Measures to protect vegetation from damage

- use salt-tolerant grasses near pavements.
- place sensitive woody plants as far from the roadways as possible.
- use salt-tolerant woody plants in essential near-roadway plantings, e.g. for erosion, noise and glare control.
- use spray-tolerant plant species in areas subject to salt spray.
- avoid planting sites near heavy runoff areas, such as low slopes.
- place shallow ditches along roadsides to divert salt runoff from sensitive trees.

algae, bacteria and plankton numbers, but reduced the supply of dissolved oxygen in the water, which could severely stress or kill fish."

Six ponds near Delta Junction, Alaska were studied because they were clustered and close to the road, and the absence of fish eliminated the need for special permits.

An introduction of CMA into the ponds, most likely through the spring runoff, increased the water hardness by adding calcium and magnesium ions. The acetate level, however, returned to normal after 19 days. The reason for this is that many of the heterotrophic organisms, or algae, bacteria and plankton, immediately used the extra acetate.

The main problem discovered in the study was that while CMA may be a less corrosive deicer and less directly toxic to plants and animals, it has a high oxygen demand and

may cause oxygen depletion in lakes. Coldwater fish, particularly salmonids which are Alaska's largest fish species, are quite sensitive to low dissolved oxygen levels. It is likely that fish would be severely stressed or even killed by the low levels of dissolved oxygen throughout the ponds.

HOT SANDING

A second potentially feasible deicer alternative to salt for Alaska DOT&PF is the use of hot sand. Regular sand applied to ice-covered roads is an effective skid-control agent when the temperature of the sand and ice is close to the melting point. But at low temperatures the sand does not penetrate the ice surface and is easily removed from the roadway by vehicles or wind.

But applying preheated sand to a cold ice surface causes the sand to penetrate the ice by melting, which increases the amount of sand retained on the surface. Full scale

tests were conducted in 1984 using the Pennsylvania Transportation Institute Circular Track Apparatus installed in a cold room operated by the Department of Mechanical Engineering at Pennsylvania State University.

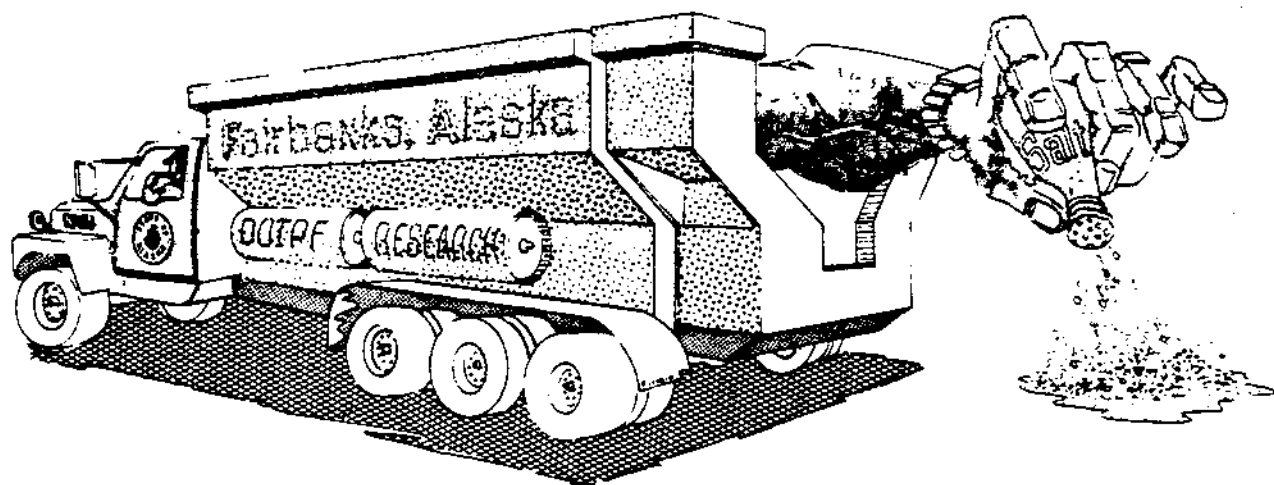
The laboratory study showed that sand applied at 180 degrees Fahrenheit provided an improvement in skid performance compared to performance on bare ice at the cold room ambient temperatures ranging from 30 degrees to minus 12 degrees Fahrenheit. At the highest cold room temperature, the skid performance increased as sand grade size decreased. At the lowest cold room temperature, skid performance increased as sand grade size increased.

The laboratory results led to field trials study of using hot sand as a deicer, which was published in August, 1987 by Matthew K. Reckard, P.E., a research engineer with Alaska DOT&PF. The project was to evaluate the effectiveness of hot

sanding through the use of mobile sand heater/spreaders which had been purchased for the field trials.

Attempts to perform the field trials, however, revealed problems. They showed that commercially available sand heater/spreaders were not adequately developed for routine use. Failure of the propane burners to light and/or stay lit created hazardous conditions due to the accumulation of unburnt fuel. This and repeated auger jamming made it difficult to operate the machinery.

Another operational hazard was the vapor clouds created by the truck-mounted hot sanders which reduced sight distances for other vehicles. Pilot cars or other traffic control would be necessary for operation on public roads. Hot sanders could presumably be used on airport runways, but they would require the runway to be closed during the operation.



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Computers and Your Health

by Billy Connor

Health and health hazards are the topic of the day. Concerns about how computers affect both physical and mental health are regularly reported in the literature. I think this is a good time to address some of those issues. The intent is not to fully discuss the topic, but I do wish to make you aware of some things you can do to minimize those effects.

The following symptoms have been tied to improper workstation design and high computer usage:

- eyestrain
- pain in the neck and shoulders
- burning eyes
- irritability
- back pain
- fatigue
- painful arms and legs
- nervousness
- swollen muscles and joints

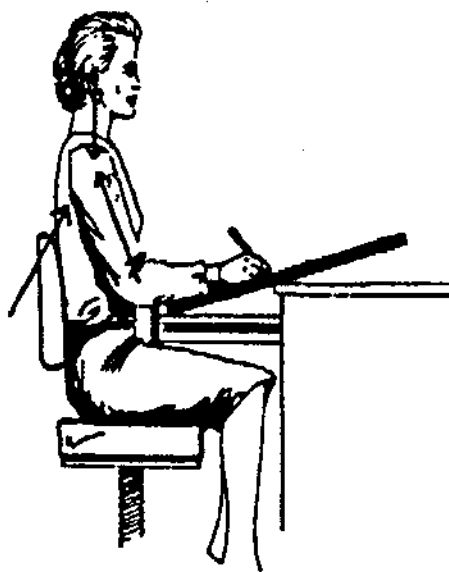
If you suffer from any of these symptoms, look at your workstation. You may also want to consult your doctor to ensure other problems don't exist.

Managers must also become concerned about worker health, if for no other reason than worker productivity. We know that as worker fatigue increases, productivity decreases.

We also know that breaks reduce fatigue. However, recent information shows that office workers, especially those who use computers, require more than the traditional 10 am, lunch and 2 pm breaks. Each worker should take a break from the computer at least once an hour. These breaks need

not require the worker leave the desk. Let's look at some ways to take a break.

One way is to vary the work routine to mix the types of work. For example, a secretary can mix in other activities such as delivering mail, Xeroxing, or filing. A manager can make phone calls, make the rounds, or review the mail. These activities take the worker away from the computer and provide rest.



Arrows show proper position of shoulder. Head is tilted slightly forward.

Another way to take a break is to do desk exercises. These include stretching, massaging tight muscles, eye exercises, and deep breathing exercises. These exercises reduce tension and stress while increasing alertness.

Fatigue and stress can also be caused by workstation design. There are a number of things to look out for here. First, make sure the height of the worksurface is appropriate. The keyboard should be about 26-30 inches from the floor. The height should allow the elbow to be at a comfortable angle with the wrist straight.

The lighting should not cause glare. Avoid bright lights behind the screen. The screen should be about 18-22 inches from the operator's eyes approximately level with the eyes. Make sure the screen is regularly cleaned. I hate looking through a dust fog all day.

Make sure chairs encourage proper posture and provide proper support. The chair height, backrest angle and backrest support should be adjustable. A chair is a personal piece of furniture. If you change offices within the same organization and you like your chair, don't hesitate to ask to take it with you. If you change jobs, consider making the chair a point of negotiation. You'd be surprised how many employers will allow employees to select a chair that fits.

The relationship between electromagnetic energy and health-related problems have been in the news media quite a lot in recent years. The most recent concern is with cellular phones. The studies are mixed. The relationship between high voltage lines and health are known. But what about Video Display Terminals, VDTs?

VDTs do emit electromagnetic energy, EME. There are many other devices which also emit EME. These include Xerox

machines, laser printers, transformers, fax machines, and televisions. If you are concerned about the effects of EME, I suggest

you discuss the potential hazards with your doctor.

There are several things you can do to reduce exposure to EME. Many of today's VDTs are

manufactured to reduce EME. Move the laser printer and other devices which emit EME further away. Turn off any unused EME emitting devices.

How Can I Adjust My Workstation?

Many workstations are not ideal. But some simple adjustments can usually improve them.



Keyboard Height

The keyboard height should be comfortable—about two and a half inches from the top of the table to the top surface of the space bar and bottom row of keys. At that height the desk top can give the needed support to the operator's wrists. If the desk top is the right height, approximately 24 to 28 inches, this will make your upper and lower arms form a comfortable angle of approximately 90 degrees. Your upper arms will then hang comfortably at your sides, taking the strain off your upper back and shoulders.

If your keyboard is not adjustable, and it is too high for comfort, try placing pads under your wrists to

elevate them to a more comfortable position.

Keyboards are rarely too low, but a low keyboard can be adjusted. Try a pad of paper or flat piece of wood under your keyboard.

Screen Height

The top of your screen should be no higher than eye level to minimize eye movement.

Screen Face Angle

The face of your screen should be tilted back about 10 to 20 degrees for easier viewing—provided this doesn't increase the glare on the screen.

If the angle of your screen is not adjustable, and the screen is too vertical, you can place a small wedge under the front of the monitor to tilt it back.

Viewing Distance

For comfortable viewing, the screen should be about 18 inches from your eyes.

Chair Height

The chair is at a comfortable working height when you don't feel

excessive pressure on your legs from the edge of the seat. Pressure from the seat front could make your legs go to sleep.

Use this method to determine your correct chair height:

- 1) Sit with the soles of your shoes flat on the floor. Keep your shins perpendicular to the floor and relax your thigh muscles.
- 2) Measure the distance from the hollow of your knees to the floor.
- 3) Subtract one to three inches.

The resulting measurement is the correct height for the top of your chair seat.

Backrest Position

Your backrest should fit comfortably at the small of your back to give your back good support.

Compensating Adjustments

When you make an adjustment, you may need to make additional adjustments to compensate for the change. For example, if your desk top is too high, you should raise your chair seat beyond the recommended height. You will then be in the right position—but your legs may be dangling! In this case, you need a footrest to minimize pressure from the seat front on your legs.

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Publications, Transportation Technology Transfer Program, DOT&PF, 2301 Peger Road, M/S 2552, Fairbanks, AK 99709-5316. For more information, you can also call (907) 474-2484.

Place a check by the publications you wish to receive.

- ___ Alaska Snow Control Workshop: Drift Prevention, ID-956, November 4-8, 1991, 150pp. Instructors: Ronald Tabler and James Elieff. T2 produced.
- ___ Americans with Disabilities Act (ADA): Accessibility Guidelines for Buildings and Facilities, ID-951, U.S. Architectural and Transportation Barriers Compliance Board, Federal Register Volume 56, No. 144, July 1991, 85pp.
- ___ Asphalt Content Determination Manual, ID-957, USDOT/FHWA, FHWA-ID-90-008, PB91-125443, June 1991, 92pp.
- ___ Building Requirement Guidelines for Airport Maintenance Garages, Trade Workshops, and Stores, ID-949, Transport Canada, April 1990, 20pp.
- ___ Deicing and Our Environment, ID-958, Salt Institute, 25pp.
- ___ Development of an Integrated Survey Vehicle for Measuring Pavement Surface Conditions at Highway Speeds, ID-965, USDOT/FHWA, July 1990.
 - ___ Volume I: Technical Report, ID-965A, FHWA-RD-90-011, 170pp.
 - ___ Volume II: Technical Details, ID-965B, FHWA-RD-90-012, 278pp.
- ___ Environmental Monitoring and Performance Evaluation of Roller-Compacted Concrete Pavement: Conley Terminal, Boston, Massachusetts, ID-972, CRREL Special Report 91-25, December 1991, 22pp.
- ___ Environmental Research Needs in Transportation, ID-961, Transportation Research Circular, TRB/NRC, Number 389, March 1992, 65pp.
- ___ Falsework, Formwork and Scaffolding for Highway Bridge Structures, ID-954, USDOT/FHWA-RD-91-062, November 1991, 121pp.
- ___ Fly Ash in Concrete, ID-979, Louisiana Transportation Research (LTRC), FHWA/LA-91/221, December 1991, 114pp.
- ___ Guidelines on the Use of Changeable Message Signs, ID-976, USDOT/FHWA, FHWA-TS-90-043, July 1991, 251pp.
- ___ Guidelines on the Use of Changeable Message Signs—Summary Report, ID-977, USDOT/FHWA, FHWA-TS-91-002, May 1991, 46pp.
- ___ The High-Occupancy Vehicle Facility System, Houston, Texas, ID-967, Texas State Department of Highway and Public Transportation and Metropolitan Transit Authority of Harris County, TTI Research Report 1146-3, February 1991, 13pp.
- ___ Highway Analysis System, ID-952, DOT&PF Plans, Programs and Budget, Juneau, 22pp. How to use by example.
- ___ Highway Statistics 1990, ID-975, USDOT/FHWA, 220pp.
- ___ Highway User Operational Information Survey, ID-968, Research Report 957-1, TTI: 2/3-18-88/9-957-1, February 1991, 164pp.
- ___ Innovative Strategies for Upgrading Personnel In State Transportation Departments, ID-970, TRB/NRC, #163, August 1990, 35pp.

- ___ **Intermodal Surface Transportation Efficiency Act of 1991: Selection of Significant Sections**, ID-953, Office of Strategic Management, Planning and Policy, December 10, 1991, 29pp.
- ___ **Issues In Statewide Transportation Planning**, ID-971, TRB Special Report 146, TRB/NRC, February 1974, 262pp.
- ___ **ITE Journal**, ID-973, Volume 62, Number 2, February 1992, 62pp.
- ___ **The Liability Crisis**, ID-974, NSPE White Paper, December 1985, 22pp.
- ___ **Myths and Facts about Transportation and Growth**, ID-960, Urban Land Institute, 1989, one page brochure.
- ___ **Performance of Jointed Concrete Pavements**, ID-963, USDOT/FHWA, FHWA-RD-89-138, Volume III: Summary of Research Findings, November 1990, 145pp.
- ___ **Planning and Design Guidelines for Sand and Urea Storage Buildings - Manual for Safety and Security Buildings**, ID-950, Transport Canada, March 1983, 31pp.
- ___ **Proceedings of the Symposium of Work Traffic Control**, ID-962, USDOT/FHWA, FHWA-TS-91-003, June 1991, 259pp.
- ___ **Single Point Urban Interchange Design and Operations Analysis**, ID-980, TRB/NRC, #345, December 1991, 101pp.
- ___ **Snow Fence Guide**, ID-955, SHRP/NRC, SHRP-W/FR-91-106, October 1991, 62pp. Order form included.
- ___ **The Snowfighter's Handbook**, ID-959, Salt Institute, 1991, 18pp. A practical guide for snow and ice control.
- ___ **Strategic Highway Safety Plan**, ID-966, Transportation Research Circular, TRB/NRC, Number 375, August 1991, 31pp.
- ___ **Structural Overlay Strategies for Jointed Concrete Pavement, Volume V: Summary of Research Findings**, ID-964, USDOT/FHWA, FHWA-RD-89-146, November 1990, 81pp.
- ___ **Utility Adjustments and Accommodation on Federal-Aid Highway Projects, Program Guide, Second Edition**, ID-969, USDOT/FHWA, FHWA-PD-91-001, October 1990, 82pp.
- ___ **Virginia Tech**, ID-978, Volume 14, Number 1, Fall 1991, 32pp. Includes: Smart Highways: Savvy technology improves driving safely; The Funding Pinch: What's a university to do?; and Virginia Tech's First Students: Student Life in the 1870's.

These publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact **Susan Earp** at the Alaska Transportation Technology Transfer Program at (907) 451-5320.

Please print your name and address below and mail to:

**Alaska Transportation Technology Transfer Program
Department of Transportation and Public Facilities
2301 Peger Road M/S 2550
Fairbanks, Alaska 99709-6394**

Name: _____ Title: _____ M/S: _____
 Organization: _____
 Address: _____
 City: _____ State: _____ Zip: _____ Phone: _____

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Place a check by the videos you wish to borrow.

- ☐ Arrow Panels, ID-231, FHWA, 25min.
- ☐ Barrier Delineation in Work Zone: The Well-Defined Path, ID-232, FHWA, 24:20min.
- ☐ Concrete Bridge Protection, Repair and Rehabilitation, ID-242, SHRP, 5:15min.
- ☐ Effective Snow Fences, ID-235, SHRP, 20:40min. Includes Part I: Benefits of Snow Fences, 10min for Chief Administrative Officers; and Part II: Key Elements of Snow Fences, 11min for Technical/Operational Staff.
- ☐ Falling Weight Deflectometer Calibration Centers: Why do we need them?, ID-241, SHRP, 7:20min, September 1991.
- ☐ Paving the Way for Tomorrow's Highways, ID-239, SHRP, 16:10min, January 1989.
- ☐ Sexual Harassment: Prevention, Recognition, and Correction, ID-233, Bureau of Business Practice, 25min.
- ☐ SHRP 1991 AASHTO Technology Transfer Fair, ID-234, SHRP, 58:40min.
- ☐ A Striper's Survival Guide, ID-238, ATSSA, 12:05min.
- ☐ Superpave: Asphalt Pavements that Perform, ID-237, SHRP, 5min., February 27, 1992.
- ☐ Technical Advancements for Maintenance Workers, ID-236, SHRP, 14:45min. For maintenance managers and work crews.
- ☐ Technical Advancements for Maintenance Workers, ID-240, SHRP, 11:45min. For chief administrative officers.

ADDITIONAL PUBLICATIONS AVAILABLE FOR LOAN

Place a check by the publications you wish to borrow.

- ☐ Construction In Cold Regions: A Guide for Planners, Engineers, Contractors and Managers, ID-982, 1991, 615pp.
- ☐ Durability of Special Coatings for Corrugated Steel Pipe, ID-994, USDOT/FHWA, FHWA-FLP-91-006, June 1991, 61pp.
- ☐ Evaluation of New Nuclear Density Gauges on Asphalt Concrete, ID-995, USDOT/FHWA, FHWA-RD-90-092, September 1991, 126pp.
- ☐ Future Aviation Activities: Seventh International Workshop, ID-992, Transportation Research Circular #390, TRB/NRC, February 1992, 63pp.
- ☐ Handbook for the Identification of Alkali-Silica Reactivity In Highway Structures, ID-1000, SHRP, SHRP-C/FR-91-101, January 1991, 49pp.
- ☐ Highway Research Abstracts, ID-991, TRB/NRC, Volume 24, Number 1, Spring 1991, 382pp.
- ☐ I-10 Papago Freeway Environmental Mitigation Measures: 91st Avenue Maricopa Interchange, ID-986, USDOT/FHWA and Arizona DOT, December 1991, 25pp.
- ☐ In Pursuit of Speed: New Options for Intercity Passenger Transport, ID-981, Special Report 233, TRB/NRC, 1991, 179pp.

Alaska Transportation Technology Transfer Program

Notes on Publications and Videos

- ___ **Innovative Contracting Practices**, ID-993, TRC #386, TRB/NRC, December 1991, 74pp.
- ___ **Intermodal Surface Transportation Efficiency Act of 1991**, ID-999, USDOT/FHWA, FHWA-PL-92-008, December 1991, 42pp.
- ___ **More Effective De-icing with Less Salt: Final Report of the MINSALT-project Summary**, ID-1001, VTI report, 369SA, 1991, 58pp.
- ___ **Public Transit Research: Rail, Bus, and New Technology**, ID-990, Transportation Research Board #1308, TRB/NRC, 1991, 149pp.
- ___ **Public Transportation: Marketing, Fare Policy and Rural Public Transportation - Research Problem Statements**, ID-987, TRB/NRC, Transportation Research Circular, #369, April 1991, 11pp.
- ___ **Rough Road Ahead: Alaska, As We Know It . . . Is About To Change**, ID-984, AKDOT&PF, March 1992, 4pp brochure.
- ___ **Service Life of Retroreflective Traffic Signs**, ID-996, USDOT/FHWA, FHWA-RD-90-101, October 1991, 107pp.
- ___ **SHRP 1991 Annual Report**, ID-988, NRC, 32pp.
- ___ **Simulator Technology: Analysis of Applicability to Motor Vehicle Travel**, ID-985, Transportation Research Circular #388, TRB/NRC, February 1992, 80pp.
- ___ **TR News**, ID-983, TRB/NRC, Number 158, January - February 1992. Includes: Telecommuting in the U.S. and Considering the Pedestrian.
- ___ **Traffic Accident Simulation Using Interactive Computer Graphics**, ID-989, LTTC, FHWA/LA-90-232, December 1991, 91pp.

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2301 Peger Road M/S 2550
Fairbanks, AK 99709-6394**

Name: _____ Title: _____ M/S: _____
Organization: _____
Address: _____
City: _____ State: _____ Zip: _____ Phone: _____

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Service Areas Deal With Tax Cap Issue

by Trent Mackey, Fairbanks North Star Borough, T2 Advisory Board Member



Declining state funds, coupled with record snowfalls, have severely impacted the level of road maintenance in the Fairbanks North Star Borough (FNSB). As a result of constant financial shortfalls, the borough road service areas can no longer function without the benefit of self-imposed taxes.

Typically, money for road projects in borough service areas comes mainly from state revenue sharing and capital improvement road grants, but these sources are quickly drying up. In fiscal years '86-'87, the state revenue sharing amounted to \$2,080 per mile. This fiscal year, that figure is down to \$1,250, with Governor Walter Hickel proposing a 33 percent reduction for the next fiscal year.

The latest figures show that the entire State of Alaska has 155 road service areas with a total of 3,010 miles of roads. FNSB harbors 102 of these service areas, with 385 miles of roads, which boils down to the fact that 66 percent of the service areas and 13 percent of the roads that have to be maintained are within FNSB. No other borough in the state comes close to the number of service areas in the North Star Borough. This leaves the borough at a disadvantage when it comes to

maintenance costs, not to mention administration.

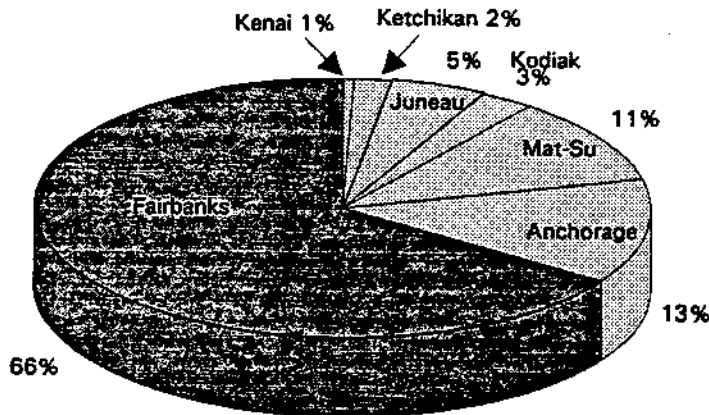
The borough does not have road powers, but neighborhoods can petition the borough to establish a service area that can tax itself and receive state funding. Each area is governed by a board of commissioners appointed by the Borough Assembly.

Each service area independently contracts with one of forty private contractors even though several areas lie within a two-mile radius. Consequently, the low mileage service areas suffer high costs of

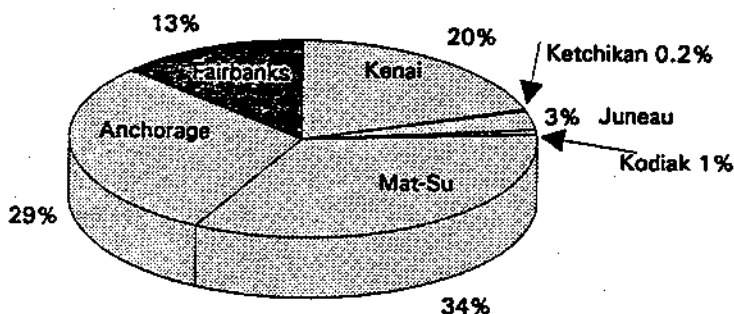
maintenance have been rejected by most service area commissioners. The commissioners prefer to continue their single service area contracting to preserve neighborhood control over services and continue their ability to tailor services unique to their own roads.

Adding to the financial woes of service area commissioners, the borough roads are deteriorating much faster than they are being repaired. Record snowfalls for the last three years brought heavy runoff during breakup, which accelerated deterioration. Due to the lack of adequate funds, deferred

PERCENTAGE OF ROAD SERVICE AREAS



PERCENTAGE OF TOTAL ROAD MILES



December 1992

equipment mobilization. Attempts to maximize limited funding by consolidating service areas or cooperative contracting for winter

maintenance has become the norm. Only the bare essentials, snowplowing and blading, occur with regularity.

There are three months remaining in this fiscal year. Some service areas have already emptied their coffers and have had to borrow from a special \$50,000 account set up by an emergency ordinance. Others, not wanting to go into deficit spending, have passed the hat to try to make ends meet.

The initial concept of service areas in the borough included provisions for local voters to raise property taxes for a special service that can be provided by the borough and is not already provided by the city. Currently a tax cap exists in the North Star Borough, which prevents service areas from increasing tax revenues without a favorable vote of the service area residents. This is the second year the Rural Services Division has mailed letters to the over 300 commissioners outlining the procedure to amend their tax cap. In order to raise taxes, commis-

sioners need to publicize and conduct a service area meeting to discuss their budget, maintenance needs, expenses and revenue increase needed. If the commission and residents support a tax increase, then the commissioner forwards their recommendations to the borough. The borough assembly must then act on an ordinance to authorize a special election using "mail in" ballots.

This year the election will be on April 6 and will be open only to service area residents. The costs of the elections are paid by the participating service areas. After election certification and budget adoption, those service areas with successful elections can look forward to new tax revenues for the following year.

Last year, 14 road and 3 fire service areas participated in individual special elections for tax cap adjust-

ments. The results were overwhelmingly favorable with 16 of 17 elections passing, including the passage of all 14 road service area elections. Collectively, these service areas increased their revenues by \$83,160, and their total revenue increased to \$2,566 per mile.

February 19 was the cut-off date for commissioners to request to participate in this year's tax cap election. Of the 19 service areas that have signed up, 10 currently have no mill rate and the remaining nine will vote to increase their mill rate. But even if these 10 new tax elections are successful, there will still be 34 service areas without a property tax for road maintenance. In time, the reserve accounts for these untaxed road service areas will run out and they, too, will be at the poll.

Sorting Out DBE/ExEEO Alphabet Soup

The Alaska DOT&PF is mandated by Congress to have a Disadvantaged Business Enterprise (DBE) program in order to be eligible for federal funds for highway and airport construction. The program certifies minority, women and disadvantaged businesses that are working in the construction-related industry. The certification process is unique to the program and follows strict federal regulations.

Federal regulation defines a Disadvantaged Business Enterprise as a business owned by a minority or a woman. In order to qualify for a DBE certification, the business must meet the following criteria:

- The firm must be an existing "for profit" business that is operational.
- The firm must be an independent business. If it is a subsidiary of a corporation, the firm must still operate in a self-sufficient manner.
- The firm must meet the federal definition of a "small business concern."
- Owners must meet the federal definition of "socially and economically disadvantaged" (women and minorities will almost always qualify).
- Owners must possess the power and expertise to control the daily operations and management of the firm.
- Owners must be able to establish ownership (at least 51 percent) through real and substantial investments of capital.

The federal law mandates that if any one of the above conditions are not met, DBE certification cannot be granted. Also, businesses must complete a re-certification application every year in order to remain certified. The business must be certified at the time the prime contractor submits the bid to the Alaska DOT&PF. For specific federal regulations on certification, a good place to start would be the federal code of regulations: 49.CFR 23.

The purpose of the DBE program is to maximize contract opportunities for disadvantaged enterprises and to improve their competitiveness. The Statewide DBE/ExEEO office establishes annual overall goals for the utilization of DBEs on the department's federally funded projects.

By federal law, Alaska DOT&PF has an annual statewide goal of subcontracting 10 percent of project work to disadvantaged businesses, said Kay Haneline, the manager for the statewide DBE/ExEEO office in Anchorage. She said the individual project goals range

from 10 to 15 percent, but are based on the characteristics of the project.

"The goals are based on the amount of subcontracting work that is available for DBEs to do, and the availability of DBEs that can do the work," Haneline said. "We basically look at a project and see what the DBEs can do."

Before being awarded a project, the prime contractor must commit to meeting the DBE project goal, or if unable to achieve the goal, be able to demonstrate specific good faith efforts that were taken to find disadvantaged businesses to meet the goal. At the completion of the project, if a prime contractor exceeded the DBE goal, they may be eligible for a bonus.



In order for the disadvantaged business to help the prime contractor meet their contract goal, the DBE firm must perform a commercially useful function on the project, such as a service necessary for the completion of the project according to the contract requirements.

The DBE program is an affirmative action program developed by the federal government and administered by the Alaska DOT&PF to assist minority and female business owners in getting work on federally funded construction projects.

On state-funded projects, the department does not set a goal for DBE utilization, but increases contracting opportunities through an incentive program.

The statewide DBE/ExEEO office handles the certification of disadvantaged businesses and publishes a directory of certified DBEs for use by the construction industry. The directory tells other contractors that a firm is DBE certified and in which areas the firm is certified in to do business.

The Other Half

ExEEO stands for External Equal Employment Opportunity. External refers to those activities related to the department's construction activities involving the employment of individuals outside the department, such as the contractor's employees.

Equal Employment Opportunity refers to federal guarantees of equal access to employment, regardless of an individual's race, color, religion, sex, or national origin (these protected groups are expanded under state law). These provisions are intended to ensure non-discrimination in the workplace. EEO complaints by non-state employees on Alaska DOT&PF construction projects are referred to the statewide DBE/ExEEO office. In turn, that office passes complaints on to the Human Rights Commission in Anchorage.



Another very important requirement monitored by the statewide DBE/ExEEO office is affirmative action. The federal requirements go further than just ensuring non-discrimination. Contractors are required to take specific affirmative action steps to achieve maximum results from their efforts to ensure equal employment opportunity. On DOT&PF public works projects, there are specific minority and women employment goals that the contractor must work to achieve in each craft used by the contractor. These goals are set by the U.S. Department of Labor and are imposed on the contractor's entire statewide workforce. This includes all of the contractor's projects, both public and private.

The statewide DBE/ExEEO office monitors contractor performance with regards to non-discrimination and affirmative action employment practices. This is accomplished through the federal Contract Compliance Review process. The Contract Compliance officer in the statewide DBE/ExEEO office reviews selected contractors each year to determine their compliance with these federal employment requirements.

Another affirmative action program implemented and monitored by the statewide DBE/ExEEO office provides training opportunities to minorities and women on selected federal construction projects. This "On-the-Job Training" program requires contractors to provide training to minorities and women in the more highly skilled construction trades or classifications, or submit good faith efforts documentation which explains why they are unable to do so. The OJT program is intended to provide construction employment opportunities to historically underutilized groups, such as women and minorities.

These equal employment and affirmative action programs are part of the DOT&PF's overall federal requirements to be eligible to receive federal funding for capital improvement projects. It's important to remember that the vast majority of construction in Alaska is funded with federal dollars. In 1964, Congress passed the Civil Rights Act which guaranteed equal employment opportunity. In 1965, the affirmative action requirements placed on federal-aid construction contractors were enacted through executive order. The DBE program for minority and women-owned businesses was enacted by Congress in 1982.

If you have any questions or would like more information, please call the statewide DBE/ExEEO office in Anchorage at (907) 266-1488. Or you can write to:

Alaska DOT&PF
Statewide DBE/ExEEO Office
4111 Aviation Avenue
P.O. Box 196900
Anchorage, AK 99519-6900

Adapted from the November, 1991 and January, 1992 editions of the DOT&PF newsletter, "The Intransit."

Transportation Enhancements For Alaska

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was signed into law by President Bush on Dec. 18, 1991, establishing a new vision for surface transportation in America.

Characterized as the most sweeping revision of federal transportation programs in 35 years, ISTEA replaces an emphasis on highway construction with the development of an efficient intermodal transportation system which balances transportation facilities and services with other cultural, social, environmental and energy goals.

One section of the new Act requires federal funds to be set aside and used exclusively for transportation enhancement activities. States receive funding through the Surface Transportation Program, set up by ISTEA. At least 10 percent of these funds are available only to eligible transportation enhancement projects.

Transportation enhancement activities are defined as projects which go beyond normal or customary transportation project activities and are included in one or more of the 10 enhancement categories (*see chart listing*). Projects that fit the requirements are eligible for federal funding that is provided to the states through ISTEA.

In the ongoing development of Alaska's Transportation Enhancement Program, a distinction is made between a Borough Program and a State Program, commonly referred to as the Core System or Core Program. Under the Borough Program, local citizens and their governing bodies have wide latitude in determining their priorities for enhancement projects. This includes program emphasis, project location and project choice, constrained principally by the 10 federal enhancement eligibility requirements.

In the Borough Program, instead of decision making, the Alaska DOT&PF will primarily provide advice and assistance. But while the boroughs are given a greater decision-making role in federal

project selections within their boundaries, their role within the Borough Program is not strictly geographic. An important distinction between the Borough Program and the Core System is one of function.

The state DOT&PF has refined its

Transportation Enhancement Categories

Transportation enhancement activities are defined as projects which go beyond normal or customary transportation project activities and fall into one or more of the following 10 categories.

- Provision of facilities for pedestrians and bicycles;
- Acquisition of scenic easements and scenic or historic sites;
- Scenic or historic highway programs;
- Landscaping and other scenic beautification;
- Historic preservation;
- Rehabilitation and operation of historic transportation buildings, structures, or facilities (including historic railroad facilities and canals);
- Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian or bicycle trails);
- Control and removal of outdoor advertising;
- Archaeological planning and research; and
- Mitigation of water pollution due to highway runoff.

principal mission as one of providing the "core" transportation system for Alaska. The purpose of the core system is to serve the long range movement of people and goods, including travel involving multiple modes,

such as air or ferry travel connections in smaller villages. This identified system of routes will serve as the basis for major areas of state capital investment of federal highway funds.

To receive the allotted amount of federal funds, FHWA requires only that proposed transportation enhancement activities have a direct relationship to the intermodal transportation system in one of three ways. This relationship may be one of function, proximity or impact. For example, an independent bike path is a functional component of the intermodal transportation system. Removal of outdoor advertising in the viewshed of a highway is justified in light of its proximity. Retrofitting an existing highway by creating a wetland to filter runoff from the highway would qualify based on the impact of the highway in terms of water pollution.

The dollar amounts designated for transportation enhancements by boroughs works out to about 13 percent of the overall target amount for each borough's allocation of ISTEA funds. The total amount of federal funds for FY94 enhancement projects in Alaska is \$12 million, \$7.5 million for the boroughs and \$4.5 million for the state Core System.

Current policy states that projects selected to utilize transportation enhancement funding for the Core System will be based on a statewide evaluation of the project proposals. A program manager position will be developed to solicit, evaluate and select projects for enhancement funding.

A majority of the enhancement projects for Alaska will correspond with the state Scenic Transportation Enhancement Program, commonly referred to as STEP. A new statewide program developed this year with a budget of \$2 million, STEP is a subset of the transportation enhancement program under ISTEA, said Sandi Anderson, the state policy coordinator. While many of the projects

under STEP fall under the transportation enhancement categories, the long-term goal of the scenic program is to benefit the state as a whole (see sidebar on STEP).

Bicycle and pedestrian facilities are also likely to be popular, said Dawn Mach, Surface Transportation Planning Manager. Other priorities will be improving existing facilities for the disabled under the Americans with Disabilities Act and environmental programs, she said.

Currently, the following transportation enhancement projects have been obligated under the FY92 and FY93 budget years:

- 1) Inventory of Outdoor Advertising, Statewide \$84,545;
- 2) Elliott Highway MP 7 North Rehab, North of Fairbanks \$50,389;

3) Dalton Highway MP 111 South Rehab, North of Fairbanks \$34,764;

4) Davis Dome Wayside, South of Delta Junction \$7,000;

5) Copper River & Northwest Railroad Historic Structure, Cordova \$200,000;

6) FY92 Annual Planning Work Program, Scenic Byways Program, Statewide \$43,000;

7) FY93 Annual Planning Work Program, Scenic Byways Program, ADA Pedestrian Facilities Audit, Statewide \$250,000;

8) Ballaine Road Rehab, Fairbanks \$44,858; and

9) Control of Outdoor Advertising \$150,000.

For more information or to submit a proposal for a transportation enhancement project, please contact one of the following offices:

Dawn Mach
DOT&PF - Headquarters
3132 Channel Drive, Room 200
Juneau, Ak. 99801-7898
Phone: (907) 465-2171
Fax: (907) 465-2460

Southeast Region DOT&PF
Planning Office
7-Mile Building
6860 Glacier Highway
P.O. Box 25531
Juneau, Ak. 99802-5531
Phone: (907) 789-6261
Fax: (907) 789-0529

Central Region Planning Office
Anchorage DOT&PF
P.O. Box 196900
Anchorage, Ak. 99519-6900
Phone: (907) 243-1111
Fax: (907) 243-1512

Northern Region DOT&PF
Planning Office
2301 Peger Road
Fairbanks, Ak. 99709-5316
Phone: (907) 451-2200
Fax: (907) 451-2313

Note: Dawn Mach, Alaska Surface Transportation Planning Manager, contributed to this article.

A STEP Up

The Alaska Scenic Travel Enhancement Program, or STEP, is a new statewide program which essentially aims to improve the quality of travel around the state. Through the Scenic Byways Program, signed on Feb. 16, 1993, STEP will provide management guidance for development and use of the transportation system to enhance the scenic, historic, cultural, wildlife, recreational, archaeological or geological resources along the system. The program is comprehensive and includes roads, ferries, airports, railroads, coastal waterways, marine parks and portages, navigable rivers and trails.

Four state agencies will jointly manage the program. Managing the transportation system and overall coordination of the statewide scenic byways program is the responsibility of the DOT&PF. The Department of Natural Resources, the Department of Fish and Game and the Department of Commerce and Economic Development will be relied upon to handle those areas

which are clearly their responsibility, such as trails management, watchable wildlife and promotion of tourism. The management team will also work with federal agencies, boroughs, local governments, Native groups and with private enterprise to ensure that STEP addresses the needs of the public.

The initial program is currently sized at \$2 million for this fiscal year. The first year of developing STEP will be financed through transportation enhancement funds, but the program is also eligible for separate scenic byways grants. The goal of STEP is to eventually branch out of the core system and into community areas to benefit the whole state.

For more information on STEP or if you would like to be involved in its development, please contact State Policy Coordinator Sandi Anderson at the following address:

DOT&PF
3132 Channel Drive
Juneau, Ak. 99801-7898
(907) 465-3900

Computer Access to ISTE A Q&A's

In early 1992, the Federal Highway Administration established a conference on the FHWA Electronic Bulletin Board System to help disseminate guidance on implementing the new ISTE A of 1991. Questions and answers and policy memos about ISTE A implementation are now available on FEBBS for read-only access.

Gaining Access

The FEBBS is accessible from any microcomputer equipped with a modem and communications software. The telephone number of the bulletin board system is 202-366-3764. The following communication parameters are used:

Speed:	1200 or 2400 baud
Data:	8 bit
Duplex:	Full
Parity:	None
Stop:	1 bit

When logging on to FEBBS, users are prompted to enter their first and last name and the FEBBS password. Users should select their own password of up to eight characters. Remember your password —you will need it whenever you log onto FEBBS again. Users will also be asked what kind of computer or terminal they are using. An IBM PC with a screen that is 80 columns wide and a display that pauses after every 24 lines should be the one used with FEBBS.

After logging on, new users should register from the FEBBS main menu and enter their first and last name, city they are calling from, job title, and office or home phone number and address. When logging off FEBBS (press the G key for Goodbye from any menu), first-time

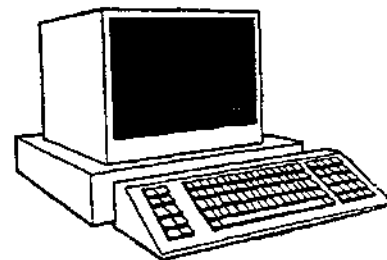
users are asked to "Leave a Message to the Sysop." Please use this chance to notify the System Operator that you are a new user who has registered, so that you will promptly be granted the appropriate access privileges for other parts of FEBBS.

There are two ways users may transfer conference information to their own computer; (1) using a communications software command to save whatever information scrolls across the screen to your own file, or (2) downloading individual files from the Files to Download section of the ISTE A Conference.

Questions on the content of the ISTE A questions and answers and policy memos should be referred to the FHWA Division Office in Juneau at 586-7418. Technical questions on using FEBBS or the ISTE A Conference may be referred to the FHWA Computer Help Desk at 202-366-1120; or to FEBBS System Operators Carl Shea at 202-366-9022 or Donna Avallone at 202-366-9037.

If you would like to obtain a copy of ISTE A categories listed on the FEBBS or more information about the electronic bulletin board, please call 1-800-262-ROAD (in Colorado) or 303-491-8648.

From the Colorado State University LTAP newsletter "The Wheel," vol. 7, No. 1.



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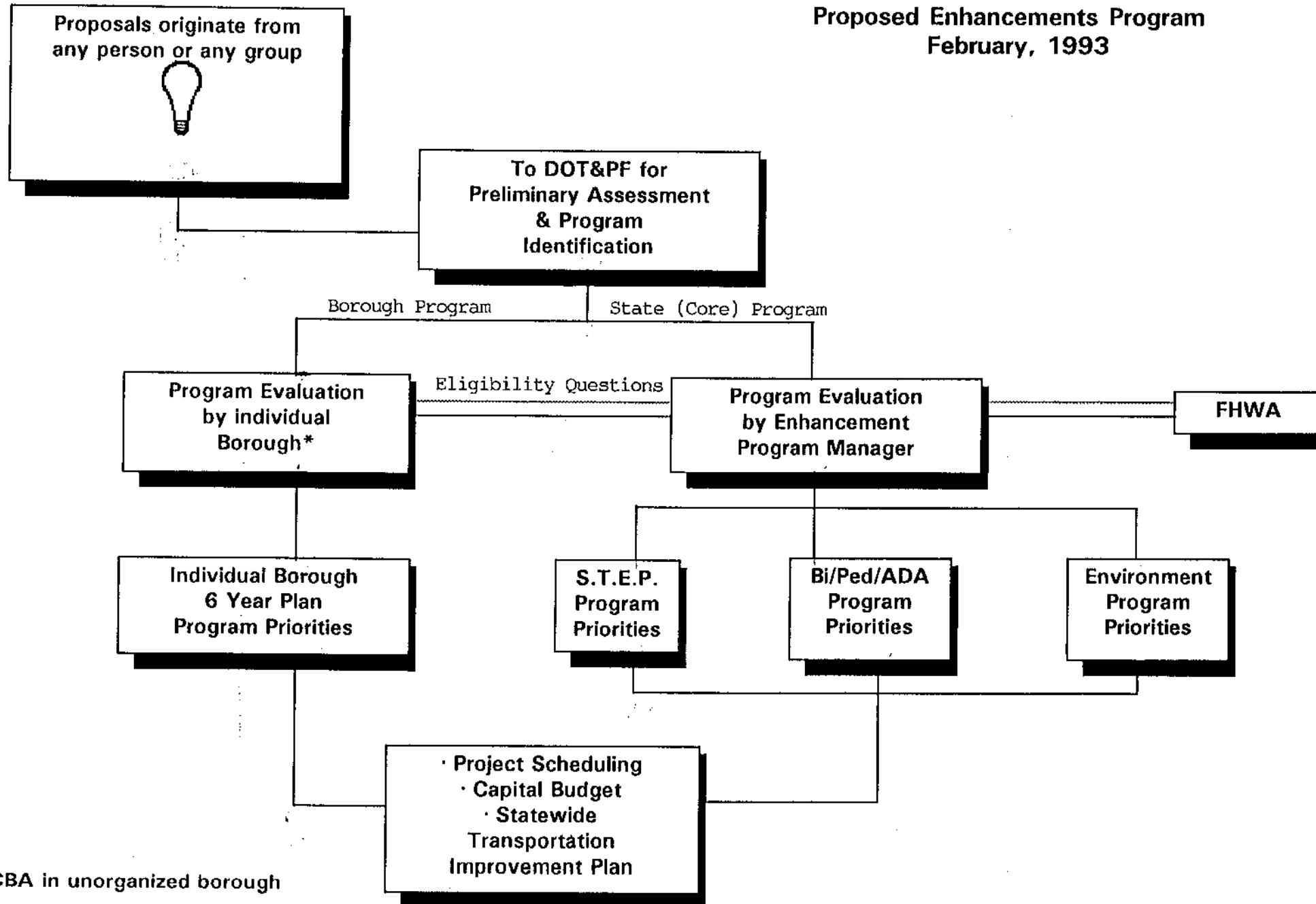
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General and concurrent sessions on topics such as wetlands permitting and management, Americans with Disabilities Act, training management matrix, maintenance practices for water quality, risk management, etc. Vendor displays and demos: large equipment outside; small equipment and products inside.

Brought to you by the City of Fairbanks, Department of Public Works and the Alaska Transportation Technology Transfer (T2) Program. Conference management services by University of Alaska Fairbanks Conferences and Special Events.

**Proposed Enhancements Program
February, 1993**



*DCBA in unorganized borough

New Standards for the MUTCD

Editor's note: Although the following changes to the Federal MUTCD were approved in 1988, they are still applicable to and utilized by traffic engineers and planners today. The revisions below, coupled with the Alaska Supplement, also apply to Alaskan traffic engineers and planners.

OVERVIEW

Since the 1978 edition of the Manual on Uniform Traffic Control Devices, the Federal Highway Administration has periodically approved changes. These revisions, included in the 1988 edition of the MUTCD, are part of the basis for all traffic control devices in Alaska and across the United States. These changes are grouped into the following five subheadings: 1) Changes in Existing Traffic Control Devices; 2) New Signs; 3) Pavement and Object Markings; 4) Traffic Signals; and 5) Construction, Maintenance, Utility and Emergency Operations. After a brief run-down of the types of changes in each subheading, a more detailed list of changes to the MUTCD follows.

Note: The numbers in parentheses here are section numbers in the MUTCD. To make searching through the MUTCD easier, we are providing a section-by-section listing of the 1988 revision.

Changes in Existing Traffic Control Devices

The first of two types of changes in this area relate to those made to the visual message on signs through either the addition or deletion of symbols or words. For instance, the Manual now allows the X% grade of an incline to be used on the Hill sign and specifies its location on the sign (2C-26). Another noticeable change has been the move from the use of word-messages to that of symbols.

The second type of change relates to the location and justification of particular signs. Examples of this type of sign change include those made to STOP signs (2B-5), Limited Sight Distance sign (2C-39), the Winding Road sign (2C-8), the Two Way Left Turn Only sign (2B-19), the One Way sign (2B-29) and the flashing Walk indication sign (4D-2). The final two changes to be mentioned relate to traffic control devices located at railroad crossings (8B-8).

New Signs

The 1988 edition of MUTCD introduces the use of six new signs. Subsection 2B-43 in the Manual was revised extensively to address new signs which designate the prohibitory or permissive use of routes. Due to the recent development in seat belt laws, the Manual has adopted a standard seat belt sign that shall be used "when a jurisdiction elects to use a seat belt symbol." (2B-44). Other signs

affected by MUTCD revisions include the Dead End and No Outlet signs (2C-37), crossover signs (2D-51) and the End School Zone sign (7B-12).

The official Traffic Control Manual for the State of Alaska is the Alaska Traffic Manual. This manual, commonly referred to as the ATM, consists of the Federal MUTCD plus an Alaska Supplement. The Alaska Supplement can be obtained from the following address:

Alaska DOT&PF
Office of Design and Construction Standards
P.O. Box 1467
Juneau, AK 99802

The cost of the Alaska Supplement is \$15. Copies of the Alaska Sign Design Specifications may also be ordered from the above address.

The Federal MUTCD can be obtained from the following address:

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

The cost of the federal manual is \$22.

Pavement and Object Markings

One of the more important changes in pavement markings is the reduction in the object height used for determining the passing sight distance. Because the size of vehicles has been drastically reduced since the last decade, the object height used for determining passing distances has been lowered from 3.75 to 3.5 feet. The Manual also discusses changes regarding pavement edge lines (2B-6), raised pavement markings (3B-14 to 3B-16) and for the design and placement of object markers (3C-1).

Traffic Signals

The Manual has increased the minimum visibility distances for signal faces given in Table 4-1 (4E-26) and Table VII-1 (7D-13). Another change is the elimination of yellow straight through arrows in the arrangement of len-

ses in signal faces (4B-9). Also, several revisions were made to the Signal Warrants section, including material regarding signal installation (4C-2), minimum pedestrian volume (4C-5) and three new warrants (4C-10).

Construction, Maintenance, Utility and Emergency Operations

Revisions in this section include new wording regarding the use of the Road Closed sign (6B-8), minimum reflective area specifications (6C-9) and use of the End Detour sign (6B-38). Other changes were made in the area of channelizing devices, such as traffic cones (3F-2), taper lengths (6C-2a and 6D-3), the lighted Advance Warning Arrow Panel (6E-7 to 6E-9) and the use of flaggers (6F-2).

DETAILED CHANGES TO THE MUTCD

Part II. Signs

One of the most noticeable changes in the Manual is the move from the standard use of word-messages in signing to symbols. Until the latest edition, engineers were not necessarily required to use word-messages over symbols for certain designated signing. The revisions, however, include four specific signs that now require the engineer to use the symbol. These signs include the Turn Prohibition sign (2b-15), U-Turn Prohibition sign (2B-16), Signal Ahead sign (2C-17) and the Two-Way Traffic sign (2c-25). The move to signing using symbols has come about because they are considered to be more easily identifiable by motorists.

B. Regulatory Signs

2B-5. Many recent questions indicate that the STOP sign is commonly being overused unnecessarily by some engineers. Because of this, the Manual now points out that consideration should be given to the less restrictive Yield sign and that periodic checks concerning its adequacy may be desirable.

2B-19. The use of the Two Way Left Turn Only sign has changed from a mandatory "shall" to an advised should "be used in conjunction with the required pavement markings."

2B-29. It is now mandatory that One Way signs at signalized intersections shall be placed "either near the appropriate signal faces or at the locations specified for nonsignalized intersections."

2B-43b. This is a new subsection discussing the use of the new prohibitory and permissive sign designations of hazardous cargo routes.

2B-43c. This is a new subsection discussing the new signs for National Network Routes, which are used to mark permissive and prohibitory truck routing.

2B-44. This section establishes the new seat belt sign (R16-1).

C. Warning Signs

2C-3. In Table II-1, A Guide For Advance Warning Sign Placement Distance, distances were added for the posted or 85 percentile speed of 65 mph. Also note that there is a typographical error in the last paragraph which should read Fig. 2-5 (page 2A-20).

2C-8. This section more specifically clarifies that the Winding Road sign is to be used as warranted for roads with three or more curves, separated by tangent distances of less than 600 feet.

2C-26. The X% grade may now be included on the Hill sign. Its location on the sign is specified.

(2C-39). This section in the 1978 Manual was removed because the use of the Limited Sight Distance sign has been completely eliminated by the FHWA. This is due to the fact that the message was deemed unclear for motorists.

2C-37. The 36" x 12" Dead End and No Outlet plaques (W14-1P and W14-2P) "may be used in combination with the Street Name (D3) sign at intersections in lieu of or in addition to the W1-1 and W14-2 signs."

D. Guide Signs

2D-35. The Manual now allows for the use of four destinations on Destination signs and specifies how the sign with the four destination names is to be assembled.

2D-45. The new Emergency Medical Services Symbol Sign (D9-13) may now be used by a State to identify medical service facilities included in the State's signing policy. The Manual gives criteria that should be met when the State develops its signing policy for medical service signs.

2D-51. The Manual introduces the use of Crossover signs on "divided highways to mark median openings not otherwise marked by Warning or Guide signs. It shall not be used to mark median openings that are restricted to the use of official or authorized vehicles."

E. Guide Signs — Expressway

2E-28. The 1988 edition of the Manual incorporates the AASHTO (American Association of State Highway and Transportation Officials) Guidelines for the Selection of Supplemental Guide Signs for Traffic Generators Adjacent to Freeways and says that "States may develop an appropriate policy for such supplemental signing."

E. Guide Signs — Freeways

2F-27. Exits from a collector-distributor road may now be numbered with an appropriate suffix and the guide signs for these exits may include either the singular Exit or two place names and their corresponding exit numbers.

2F-33. The Manual now requires that "no more than six general motorist services are to be displayed on one (General Motorist Service) sign, including appended panel."

2G-2J. The four sections (2G-5, Specific Service Signing; 2H, Recreational and Cultural Interest Area Signs; 2I, Tourist Oriented Directional Signs; and 2J, Signing for Civil Defense) were established as separate sections in the latest revision.

Part III. Markings

B. Applications of Pavement and Curb Markings

3B-5. Due to the reduction in the average height of the vehicle driver's eye level, the Manual has lowered the object height used for determining the passing sight distance from 3.75 feet to 3.5 feet.

3B-6. Edge lines shall now be provided on all rural multi-lane divided highways.

3B-11. Channelizing lines for exit ramps are now mandatory and no longer simply advised. They are "to be placed along both sides of the neutral area between the main roadway and the exit ramp lane."

3B-14, 3B-15, 3B-16. These three sections were added to the latest Manual edition. They discuss in detail the use of raised pavement markings; in particular, how they can be used to supplement or substitute for pavement markings in particular instances.

3B-22. The Manual says that "when a lane is assigned full or part time to a particular class or classes of vehicles the preferential lane markings shall be used... Markings should conform to the purpose the lane serves a majority of the time." In addition, the Manual now states that engineering judgment should be exercised concerning the need for supplemental devices.

C. Object Markings

3C-1. Striped object markers consist of alternating black and reflectorized yellow stripes. (White is no longer an option.)

3C-1.1 Specifications were added saying that markers for objects in the roadway or 8 feet or less from the shoulder or curb should normally be 4 feet above the surface of the nearest traffic lane. The object marker may be 4 feet above the ground when marking objects more than 8 feet from the shoulder or curb.

3D-5. The Manual now says the delineator's lateral placement outside the outer edge of the roadway may be 2 to 8 feet instead of the old placement of 2 to 6 feet.

F. Barricades and Channelizing Devices

3F-2. The Manual specifies a minimum height of 28 inches for traffic "cones used on freeways and other high speed roadways" and where more conspicuous guidance is needed. The Manual now specifies that the minimum 6-inch reflectorized band shall be placed a minimum of 3 inches but no more than 4 inches from the top. For 28-inch or larger cones, "the standard 6-inch band shall be supplemented with an additional 4-inch white band spaced at a minimum of 2 inches below the 6-inch band."

Part IV. Signals

B. Traffic Control Signals

4B-9. A straight through Yellow Arrow is no longer permitted.

4B-12. Some minimum visibility distances in Table 4-1 have been changed.

4B-28, 4B-29. These are new sections that discuss the needs of and provisions for pedestrians in the operation of traffic control signals and the use of pedestrian detectors (typically push buttons).

C. Warrants

4C-2. The Manual now states that satisfaction of a warrant or warrants for traffic control signals is not in itself justification for a signal but that an engineering study should be conducted to determine if a signal will improve the safety and operation of an intersection.

4C-5. The criteria to be met for Warrant 3, Minimum Pedestrian Volume, has been changed considerably.

4C-10.1, 4C-10.2, 4C-10.3. The Manual has created three new warrants that discuss intersection volumes and delay (10.1, Warrant 9, Four Hour Volumes; 10.2, War-

rant 10, Peak Hour Delay; and 10.3, Warrant 11, Peak Hour Volume), and references nomographic figures to be used in determining if the warrant has been satisfied.

D. Pedestrian Signals

4D-2. A Walk indication shall not be flashed.

Part VI. Traffic Controls for Street and Highway Construction, Maintenance, Utility and Emergency Operations

6B-8. A change was made for the Road Closed from "shall" to "may be used where the roadway is closed to all traffic except contractor's equipment and officially authorized vehicles and may be accompanied by appropriate detour signing."

6B-38. Introduces the End Detour sign that may be used to advise motorists that the detour has ended.

6C-2a. This section, Taper Lengths, was created to introduce Table VI-2, Taper Length Criteria for Work Zones, which establishes the criteria for channelization taper lengths used for different taper types.

6C-9. The Manual now says that barricades intended for use on expressways, freeways, and other high speed roadways "shall have a minimum of 270 square inches of reflective area facing traffic."

6D-3. The 1988 Manual contains this new section which says that short-term pavement markings must conform to the requirements in Sections 3A and 3B with five exceptions which are listed.

6E-7, 6E-8, 6E-9. In the 1978 edition, one section was devoted to lighted Advance Warning Arrow Panels. This has now been expanded to Sections 7, 8, and 9 which discuss, respectively, a) the usefulness of the panel as a guide for motorists, b) its applications at the site, and c) its design specifications.

6F-2. The Manual now states that sign paddles, not flags, should be the primary handsignalling device and says flag use should be limited to emergency situations or when traffic can best be controlled by a single flagger.

6F-3. Design criteria for flagger vests is given. The Manual specifies that it shall be reflectorized in either

orange, white, yellow, fluorescent red-orange, or fluorescent yellow-orange.

Part VII. Traffic Controls for School Areas

7B-12. The Manual states that an End School Zone sign may be used in place of the mandatory standard Speed Limit sign which is required at the end of an authorized and posted school speed zone.

7D-13. The minimum visibility distances for school area traffic signals shown in Table VII-1 have been increased.

Part VIII. Traffic Control Systems for Railroad-Highway Grade Crossings

B. Signs and Markings

8B-1. The Manual introduces the use of the Tracks Out of Service sign that may be installed until the tracks are removed.

8B-3. The Manual specifies that placement of the Railroad Advance Warning Sign shall be in accordance with Table II-1 and introduces the use of the W10-2, W10-3, and W10-4 signs that may be installed on highways parallel to railroads.

8B-4. The Manual now states that "a portion of the pavement marking symbol should be directly opposite the advance warning sign."

8B-8. The Manual specifies the location of the Do Not Stop On Tracks sign for best motorist visibility and now says that "on multi-lane roads and one-way roadways a second sign may be used."

8C-1. The Manual specifies that "when tracks are not in service, gate arms shall be removed" and "signal heads shall be hooded, turned or removed."

Part IX. Traffic Controls for Bicycle Facilities

9B-23. The MUTCD has now standardized the Bicycle Parking Area sign.

Adapted from the Tennessee Transportation Assistance Program "Roadtalk," June, 1992.

PROGRAM ANNOUNCEMENT

NCHRP-IDEA

National Cooperative Highway Research Program (NCHRP) Innovations Deserving Exploratory Analysis (IDEA)

January 1993

INTRODUCTION

The National Cooperative Highway Research Program's Innovations Deserving Exploratory Analysis (NCHRP-IDEA) project is funded by the United States Federal Highway Administration and state highway agencies in cooperation with the American Association of State Highway and Transportation Officials. The project is managed by the Transportation Research Board (TRB).

NCHRP-IDEA seeks to introduce new technologies, methods, or processes for application to highways and intermodal surface transportation through the development and testing of nontraditional and innovative concepts, including application of those from other technology sectors that have not yet been tested in the highway sector. NCHRP-IDEA will consider deserving innovations in any technology area for highway and intermodal surface transportation systems. Technology emphasis areas for the first 2-year project cycle from October 1992 to September 1994 are identified in this solicitation.

Investigators wishing to participate in the IDEA program are required to submit to NCHRP-IDEA a three-page concept proposal describing the innovation proposed for investigation and the potential impact of the innovation on current practice in accordance with the guidelines described in this project announcement. NCHRP-IDEA will review the concept proposal and, if it is found appropriate and promising, will invite the proposer to submit a more detailed proposal. The two-step proposal preparation process is designed to permit guidance and feedback from TRB on appropriate concepts before the detailed proposal is prepared. All IDEA awards are fixed-price contracts not to exceed \$100,000 and must be completed within 12 months.

IDEA concepts will be characterized by one or more of the following features:

1. Engineering and scientific innovations that offer significant promise for developing into usable and cost-effective technologies, processes, or products.

2. High-risk but credible technical concepts that offer potential for significant technological breakthroughs and large payoffs.
3. New concepts that offer the potential for advancing the state-of-the-art highway and intermodal surface transportation technologies or those that may emerge into new technology areas for highway application.
4. Advanced concepts and products developed for other engineering applications but not as yet tested or applied to highway practice.
5. Advanced technologies tested or used in overseas practice but as yet not tested or proven useful in U.S. practice.

Feasibility Phase (Type I)

An IDEA investigation in the feasibility phase (Type I) would generally be an evaluation of an innovative technical concept for which adequate knowledge, technical information, or data are not currently available to ascertain its feasibility. The purpose of the Type I investigation is to determine the scientific and technical validity of the concept through appropriate small or bench scale experimentation and/or analytical verification. The results should demonstrate proof of concept for (1) subsequent design and fabrication of a prototype to perform field scale experimentation or (2) development of guidelines for the application of a new method, process, or technology to practice.

Advanced Testing Phase (Type II)

NCHRP-IDEA will consider a Type II investigation to perform larger scale or field testing of deserving and feasible IDEA concepts. Concepts proven feasible by Type I investigations or innovations developed and tested from outside the NCHRP-IDEA project are eligible for Type II proposals. These include testing of new technological developments from overseas and other industrial technologies, such as from the aerospace and computer and information technology sectors.

Products that are currently available, marketed, used, or tested for U.S. highway application are not eligible for investigation.

A typical Type II investigation would consist of developing prototypes of *proven innovations*, evaluating the product under actual or simulated highway operating conditions, and estimating the efficacy of the product for highway application. The results of a Type II investigation should provide adequate information on the cost effectiveness and potential application or acceptance of the product to practice.

Budget and Duration

The IDEA award amount, not to exceed \$100,000, will be based on the technical tasks required. All IDEA investigations must be completed within 12 months. Cost sharing is recommended but is not a requirement for Type I proposals. Substantial cost sharing is a requirement for all IDEA Type II proposals.

NCHRP-IDEA Technology Areas

The NCHRP-IDEA project committee has identified emphasis areas for investigation and will show preference for concept proposals addressing those areas, but all proposals addressing innovations in highway and intermodal transportation technology will be considered.

The primary emphasis areas for NCHRP-IDEA during the first 2-year project cycle from October 1992 to September 1994 are:

Technology Area 1: Pavement Materials, Construction, and Performance

i. Quality Control and Pavement Performance. Suggested innovations for asphalt and portland cement concrete pavements include, but are not limited to, the following:

- Application of modern materials technologies to improve pavement performance.
- Real-time monitoring and control technologies for improving the mechanical integrity of pavement construction.
- Innovative pavement design concepts, including material systems, to extend the life cycle of pavements and concepts for resolving critical design problems such as pavement drainage.
- Innovative test methods and technologies for monitoring pavement condition including rapid evaluation of pavement distress and damage.

- Instrumentation systems for rapid measurement and evaluation of dynamic response of pavements, and pavement-vehicle interactions.

ii. Recycled Pavements and Waste Product Utilization. The use of recycled asphalt paving materials and aggregate recovered from waste portland cement concrete and the inclusion of industrial and municipal waste product in pavements are growing. Innovative techniques to identify performance attributes, to modify mixture designs to ensure compatibility with these materials, and to control construction to achieve pavement quality are lacking. Potential IDEA innovations might include, but are not limited to, the following:

- Alternative binder materials or additives to improve the quality of mixtures including recycled and/or waste product materials.
- New, enhanced, or automated technologies for controlling recycled materials quality and the mix process.
- In-situ test methods to ensure the construction quality of pavements using recycled pavement material and asphalt mixes that include waste products such as scrap tire rubber.
- Innovative and cost-effective approaches to utilize waste material, including recycled and processed waste, without causing adverse impacts on pavement performance.

Technology Area 2: Pavement Maintenance, Repair, and Rehabilitation

Pavement maintenance, repair, and rehabilitation represent a major portion of highway expenditures. Areas for IDEA innovations include, but are not limited to, the following:

- Application of advanced and cost-effective materials technologies for pavement maintenance and repair.
- Application of advanced command, communication and control technologies for highway maintenance including surveillance of traffic flow, monitoring of critical maintenance areas, and management of maintenance.
- Rapid diagnostic technologies including nondestructive evaluation methods for determining pavement maintenance or rehabilitation needs before failure or breakdown.
- Environmentally benign anti-icing or de-icing materials and systems, including pavement-resident materials and embedment technologies for snow and ice control.

Technology Area 3: Materials for Highway Structures

The innovations should focus on improving the reliability and service life of highway structures through advanced materials development and cost-effective construction processes and by minimizing potential for damage and failure. Suggested IDEA innovations include, but are not limited to, the following areas:

- New, cost-effective materials technologies with improved structural performance.
- Cost-effective and noncorrodible materials for concrete reinforcement and protective coatings to inhibit corrosion.
- New materials and technologies for retrofitting structures to minimize potential damage caused by earthquakes and other natural hazards.
- Nondestructive evaluation technologies for rapid inspection of damage and deterioration of structures.
- New technologies for fastening, jointing, bolting, and bonding of structural components.

Technology Area 4: Highway Safety Systems

The protection of the traveling public and highway maintenance and construction workers from traffic hazards is a high priority. Suggested IDEA innovations include, but are not limited to, the following areas:

- Technological innovations to warn or redirect drivers from work zones and temporary hazards including automated and intelligent roadside and in-vehicle warning and alert systems, vehicle proximity signal devices, and innovative traffic control devices.
- Improvements to highway geometric design, traffic operations and vehicle-roadway interaction systems to reduce vehicular and pedestrian accidents.
- New materials and designs for barrier systems including portable or vehicle-mounted impact attenuators.
- New pavement concepts, including pavement surface treatment and texturing, to improve safety in high traffic areas and in adverse weather conditions.

CRITERIA FOR SELECTION

The following criteria will be used for evaluating and selecting NCHRP-IDEA concept proposals:

1. Potential Payoff
 - Problems solved by the innovation and other potential benefits to highway practice.
 - Likelihood that innovation would be practical to implement.
2. Quality of the Innovative Concept
 - Scientific and technical merit.
 - Magnitude of technological advance (does it promise a breakthrough?).
3. Investigative Approach and Investigation Team
4. Cost
 - Cost of Proposed Investigation.
 - Cost sharing contributions available (cost sharing is required for all Type II investigations).

GUIDELINES FOR CONCEPT PROPOSALS

All concept proposals for NCHRP-IDEA investigations should be submitted in a three-page format to facilitate review.

First Cover Page: The required cover page format is shown in Figure 1.

Two-Page Summary Description: This information should be provided in the next two pages following the cover page and in the sequence indicated below:

1. Innovation and investigation: Describe the envisioned product, the technical principles applied in the investigation, and the expected results.
2. Potential impact of the product: Describe the engineering problems addressed and other anticipated benefits of the innovation.
3. Research Team and Facilities: List the members of the investigation team and research facilities available.
4. Other related work and investigations: Summarize the state-of-the-art technologies and results that relate to the proposed concept, including other similar investigations completed, planned, or proposed by the investigator.
5. Investigation plans and cost: Outline the scope of the planned investigation and key tasks to be performed. Indicate total cost requested from NCHRP-IDEA to perform the study and cost sharing available, if any.

After TRB review of the concept proposals, investigators offering suitable concepts will be invited to submit expanded Type I or Type II IDEA proposals. The invitation to submit a proposal does not signify or guarantee an NCHRP-IDEA award, but merely provides the investigator information that the

concept is suitable for award consideration. Directions for preparing expanded proposals will accompany the invitation.

PROPOSAL SUBMISSION

Eligibility. NCHRP-IDEA investigations are encouraged from investigators in all science and engineering disciplines. BACKGROUND AND WORKING FAMILIARITY IN HIGHWAY RESEARCH OR CIVIL ENGINEERING IS NOT A PREREQUISITE FOR NCHRP-IDEA!

Deadline for Receipt of Proposal. Investigators may submit concept proposals at any time. NCHRP-IDEA will evaluate and review concept proposals for NCHRP-IDEA awards on a continual basis. This announcement is valid for proposals submitted through December 1993.

Revisions to Proposal. Investigators may submit revisions to concept proposals within 30 days after submission or before the concept is evaluated by TRB, whichever occurs first.

Information on the Proposal Status. All correspondence relating to the proposal will be sent to the principal investigator, unless an alternative forwarding address is specifically requested by institution, investigator, or sponsors of proposals.

Review Time. The concept proposal review process is expected to take about 90 days. No information on approval of concept proposals will be available until the evaluation process is completed.

Patents and Technical Data Rights. TRB will make every effort to protect the rights of proposers and to protect technical data and other proprietary information in proposals. Proposals will be used for evaluation purposes only and will not be publicly disclosed. Rights to technical data, patent rights, and copyrights including software developed under the NCHRP-IDEA contract shall remain with the investigator or the sponsoring institution. TRB and FHWA shall have the right to publish information and results from the investigation.

Submission: Fifteen (15) copies of concept proposals in the recommended format should be sent to:

Transportation Research Board
Division of Special Programs/NCHRP-IDEA
Attention: Dr. K. Thirumalai
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

National Research Council
NCHRP-IDEA
CONCEPT PROPOSAL COVER SHEET

For Use by TRB-IDEA	Date Received	Proposal Number	
Technology Area		Budget \$ _____	
Title of Investigation		Duration (Months) _____	
Name/Address of Submitting Organization and Business Contact		Telephone	Fax
Name/Address of Principal Investigator			
Names of Key Investigators and Affiliation			
Abstract (150 words or less)			

Figure 1

TRANSIT-IDEA

A PROJECT DESIGNED TO FOSTER INNOVATIVE CONCEPTS AND TECHNOLOGIES FOR APPLICATION TO THE TRANSIT PRACTICE

An Innovations Deserving Exploratory Analysis (IDEA) project will be initiated as part of the Transit Cooperative Research Program (TCRP) managed by the TRB through a cooperative agreement between the Federal Transit Administration, National Research Council, and the Transit Development Corporation (TDC), a nonprofit transit educational and research arm of the American Public Transit Association (APTA). TRB is planning to release a TRANSIT-IDEA project announcement by April 1993.

The TRANSIT-IDEA project will form one of the three components of the new IDEA program in TRB. The IDEA program will foster the development and application of innovative technologies, methods and processes for application to highway transportation systems. TRANSIT-IDEA proposals will be solicited for proving the feasibility of new concepts and for examining potential application of cross-cutting technological advances to transit practice. Proposals submitted to the TRANSIT-IDEA project should, in general, have the following characteristics:

•• Technical concepts that may require a high-risk investigation to succeed but would offer a potential for significant technological breakthrough and a large payoff, if successful.

•• Innovations that offer a potential for advancing the state-of-the-art Transit technologies or have the promise for cost-effective application to transit practice.

•• Advanced, cost-effective, and user-friendly technologies developed in other engineering developments but not as yet tested, applied, or available for transit operations.

IDEA proposals may address any technology area applicable to transit operations. IDEA should result in products that are cost effective and user friendly, and they must have potential to significantly improve transit practice. The innovations may include new methods, processes, products, or systems to meet transit needs in a variety of important areas for transit operations, such as improving human resource effectiveness and productivity, streamlining service configurations and delivery systems, improving equipment and instrument systems, applying advanced maintenance systems and developing improved safety technologies and systems. Proposals may be submitted anytime during the year. Each IDEA investigation will be a fixed-price contract not to exceed \$100,000 and should be completed within one year.

A TCRP project committee will be established by the TRB to provide guidance to the IDEA project. A detailed project announcement is planned to be released by April 1993, after approval by the TRANSIT-IDEA project committee. Individuals interested in participating in TRANSIT-IDEA may request copies of the program announcement by writing to Dr. K. Thirumalai, Transportation Research Board-IDEA Program, National Research Council, 2101 Constitution Avenue NW, Washington DC 20418.

IVHS- IDEA

A PROGRAM DESIGNED TO FOSTER INNOVATIVE CONCEPTS AND TECHNOLOGIES FOR APPLICATION TO INTELLIGENT VEHICLE HIGHWAY SYSTEMS (IVHS)

An IVHS- IDEA program has been established in support of the national program on Intelligent Vehicle Highway Systems. The IDEA program will explore, evaluate, test and develop application of new concepts, innovative technologies, methods and processes for highway, transit and inter-modal surface transportation systems. The IVHS-IDEA program is funded by the Federal Highway Administration (FHWA) and managed by the Transportation Research Board (TRB).

IVHS-IDEA projects will investigate the feasibility of new technological concepts and examine potential application of cross cutting technological advances to IVHS. Proposals to the IVHS-IDEA program should, in general, have the following characteristics:

- ** Technical concepts that may require a high risk technical investigation but would offer a potential for significant technological breakthrough and a large payoff, if successful
- ** Innovations that offer a potential for advancing state-of-the-art IVHS technologies or have the promise for cost-effective application to IVHS practice.
- ** Advanced, cost-effective and user-friendly technologies and systems developed in other engineering areas but not as yet tested, applied or available to IVHS

Proposals may be submitted anytime during the year. Each IDEA project will be a fixed price and cost effective contract below \$100,000 and should be completed within one year.

Proposals on IVHS- IDEA may address any technology area relevant to IVHS and should result in products, methods or processes that are cost effective, user friendly and can be applied to advance the state-of-the-art IVHS practice. The products from IVHS-IDEA should have a potential to result in significant improvements to increase traffic safety, reduce traffic congestion, enhance mobility or advance the productivity of commercial vehicle operations.

IDEA innovations should match the needs of the IVHS program in key functional areas of technologies including Advanced Traffic Management System (ATMS), Advanced Traveler Information System (ATIS), Advanced Vehicle Control Systems (AVCS), Commercial Vehicle Operations (CVO) and Advanced Public Transportation Systems (APTS).

TRB is establishing an IVHS - IDEA Advisory committee to provide guidance to the IDEA program and interfacing with activities by IVHS-America. TRB will release a detailed IVHS-IDEA project announcement by April 1993..

Individuals interested in IVHS-IDEA may send their recommendations on IDEA projects or request copies of the program announcement by writing to Dr. K. Thirumalai, Transportation Research Board - IDEA Program, National Research Council, 2101 Constitution Avenue NW, Washington DC 20418.

**T2 CALENDAR OF EVENTS**

To publicize an event in our calendar, contact us at (907)451-5320.

APRIL						
S	M	T	W	T	F	S
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4	5	6	7	8	9	10
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See Meetings Around Alaska.

Training, see middle column.

JUNE						
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Mar 23-25: ATSSA Worksite Traffic Supervisors Training Course, Anchorage, (907) 451-5320.

Apr 5-8: Systematic Development of Informed Consent, Fairbanks, (907) 451-5320.

Apr 5-8: NHI #13211 Rock Blasting, Anchorage, (907) 451-5322.

Apr 6-8: ATSSA Worksite Traffic Supervisors Training Course, Juneau, (907) 451-5320.

Apr 13-14/15-16/19-20: Aggregate Crushing Course, Anchorage/Fairbanks/Anchorage, (907) 451-5322.

Apr 13-15: ATSSA Worksite Traffic Supervisors Training Course, Anchorage, (907) 451-5320.

Apr 27-30: Citizen Participation by Objectives, Anchorage, (907) 451-5320.

May 10-13: NHI #13211 Rock Blasting, Fairbanks, (907) 451-5322.

May 20-21: FHWA Older Driver/Pedestrian Conference, Phoenix, AZ, (602) 266-6521.

May 20-22: IRWA Course 204 Group Communication, Fairbanks, (907) 451-5227.

Jul 25-28: Pacific Rim TransTech Conference, Seattle, WA, (206) 753-6014.

MAY						
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Meetings Around Alaska

Alaska Society of Civil Engineers - Anchorage: Monthly, 3rd Tues., noon, Northern Lights Inn. Fairbanks: Monthly, 3rd Fri., noon, Captain Bartlett Inn. Juneau: Monthly, except June - August, 2nd Wed., noon, Breakwater Inn.

Alaska Society of Professional Engineers - Fairbanks: Monthly, 1st Fri., noon, Captain Bartlett Inn.

Alaska Society of Professional Land Surveyors - Anchorage: Monthly, 3rd Tues., noon, Executive Cafeteria Federal Building. Fairbanks: Monthly, 4th Tues., noon, Sunset Inn.

Institute of Transportation Engineers - Anchorage: Monthly, 3rd Thur., Sourdough Mining Company.

International Right of Way Association - Anchorage: Sourdough Chapter 49: Monthly, except July & December, 3rd Thur., noon, West Coast International Inn. Fairbanks: Arctic Trails Chapter 71: Monthly, except December, 2nd Wed., noon, TBA. Juneau: Totem Chapter 59: Monthly, 1st Wed., noon, Mike's Place in Douglas.

American Public Works Association: September 24 and October 29, noon, West Coast International Inn, Sandi McWilliams, (907) 279-1122.

International Conference of Building Officials - Fairbanks: Alaska Northern Chapter: Monthly, 1st Wed., noon, Zach's at Sophie Station, 459-6720.

American Water Resources Association - Alaska Section, Northern Region: Monthly, 3rd Wed., noon (Brown Bag Lunch), Room 531 Duckering, University of Alaska. Contact Larry Hinzman, 474-7331, for information.

Who's Who in Alaska's Transportation Network

Spotlight on Dave Esch, Research Engineer, DOT&PF Engineering & Operations Standards, Juneau

The first time Dave Esch came to Alaska was in the summer of 1963. The state Department of Highways was recruiting engineering students and Esch, fresh out of undergraduate school, jumped at the chance.

"Everybody wants to go to Alaska," Esch said. "That was my opportunity."

Esch was born in Dodgeville, Wisconsin on May 27, 1941. He grew up in the state of Wisconsin, eventually attending the University of Wisconsin, Platteville Campus as an undergraduate student. Armed in the spring of 1963 with a B.S. in civil engineering, he spent his first Alaskan summer as a grade inspector on the Denail Highway from Paxson to the Tangle River.

Esch returned to the midwest that fall to pursue a master's degree in civil engineering at University of Illinois. After his graduation in 1964, Esch spent a year working for Dames and Moore Consultants in San Francisco, California. But in 1965, he was again ready for fresh, new challenges.

So he came to Juneau, Alaska.

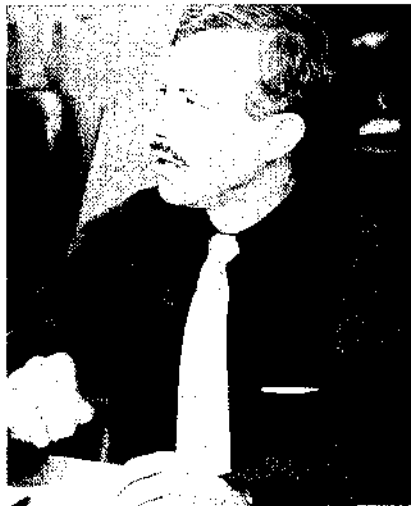
Esch turned down various opportunities in many different places around the globe, including jobs in New Zealand and Australia, to return to Alaska. The reason, he said, was because "it was the best job offer I had."

From 1965 to 1967 Esch worked as a Materials Engineer Assistant for the Department of Highways in Douglas. He moved to Fairbanks to fill the position of State Soils Engineer for the next three years, then, in 1972, became the Engineer of Tests and Head of the State Materials Lab which was located in College at the University.

After the Department of Highways was merged into the Department of Transportation and Public

Facilities, Esch worked as the Highway Research Program Manager at Statewide Research, a position he held until 1991. When the state dissolved the Statewide Research Section, instead of sending the responsibilities for highway research to UAF, Esch's position was transferred down to Juneau.

However, instead of going to Juneau right away, Esch arranged to work as a Pavement Materials Engineer at the Strategic Highway Research Program in Washington D.C. for a year.



"I was on loan from the Alaska DOT&PF and the timing was good to do it," Esch explained. "Their materials engineer retired in June, 1991 and I took up in July. About one-third (of my salary) was from the state highway office, the rest was paid by the National Academy of Sciences."

His duties at SHRP included writing new test procedures and arranging testing lab contracts, along with a lot of setting field trials of instruments measuring moisture and freezing.

One of the reasons Esch enjoys the research side of engineering is because it is "much more interesting to look at new developments and to see how to change them." This is why he said he got into studies regarding permafrost in Alaska, because "so little is

known." A quick look at his fields of expertise and professional activities further illustrate his affinity for ground research in arctic regions. His areas of proficiency include earth slides and corrective measures, permafrost control methods for roads and airfields, and frost heave prediction and control, and pavement performance. Esch's roster of professional activities list him as past chairman of the ASCE Cold Regions Research Committee, past chairman of the TRB Committee on Frost Action, member of the ASCE Frozen Ground Committee and Programs Committee, and member of the TRB Committees on Transportation, Flexible Pavements and Frost Action.

His liking for research and new developments is one of the reasons he joined the Technology Transfer Advisory Board in September of 1992.

"It's an interesting program, and another area of training people in new ways," he said.

Currently, Esch works as a Research Applications Engineer for the state DOT&PF, a position he has held since returning from Washington D.C. He lives in Juneau with his wife, Paula, whom he married in 1964; his two kids, Nevette, 28, and Brady, 23, both live in California.

His work responsibilities basically revolve around managing the highway research program for the state, which include setting up the funding arrangements and project agreements, organizing advisory committees and working in conjunction with the statewide university system and consultants.

His favorite aspect of his job, Esch said, "is the ability to work with different groups and put the best possible team together to study problems in the department."